

**National Assessment of the
Consequences of Climate Variability and Change
for the United States**

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February 2001

The Global Change Research Act of 1990 [Public Law 101-606] gave voice to early scientific findings that human activities were starting to change the global climate: (1) Industrial, agricultural, and other human activities, coupled with an expanding world population, are contributing to processes of global change that may significantly alter the Earth habitat within a few generations; (2) Such human-induced changes, in conjunction with natural fluctuations, may lead to significant global warming and thus alter world climate patterns and increase global sea levels. Over the next century, these consequences could adversely affect world agricultural and marine production, coastal habitability, biological diversity, human health, and global economic and social well-being.

To address these issues, Congress established the US Global Change Research Program (USGCRP) and instructed the Federal research agencies to cooperate in developing and coordinating a comprehensive and integrated United States research program which will assist the Nation and the world to understand, assess, predict, and respond to human-induced and natural process of global change. Further, the Congress mandated that the USGCRP

shall prepare and submit to the President and the Congress an assessment which

- 1) integrates, evaluates, and interprets the findings of the Program and discusses the scientific uncertainties associated with such findings;*
- 2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and*
- 3) analyzes current trends in global change, both human-induced and natural, and projects major trends for the subsequent 25 to 100 years.*

To provide an initial picture of what climate change might mean for the US, the USGCRP initiated the *National Assessment of the Potential Consequences of Climate Variability and Change* in 1997. This Assessment is focused on answering why people in the US should care about climate change and how actions might be taken to effectively prepare for an average national warming of 5° to 9° F and significantly altered patterns of precipitation and soil moisture. It is just such changes that are simulated by global climate models assuming that global emissions of carbon dioxide and other greenhouse gases continue to climb as projected.

The overall goal of the Assessment has been to analyze and evaluate what is known about the potential consequences of such changes in the context of other pressures on the public, the environment, and the Nation's resources. By building broader understanding of the prospects for climate change and of the importance of these changes for the Nation, the USGCRP is aiming to promote an intensifying exploration of options that can help to reduce the vulnerability of individuals, public and private sector organizations, and the resource base on which society depends. With good information, these responses should be able to help build resilience to climate variations and, to at least some extent, avoid or reduce the deleterious consequences of climate change while taking advantage of conditions that may be more favorable.

The Assessment process has been broadly inclusive in its approach, drawing on inputs from many sources. Support has been provided in a shared manner by the set of USGCRP agencies, including the departments of Agriculture, Commerce (National Oceanic and Atmospheric Administration), Energy, Health and Human Services, and Interior plus the Environmental Protection Agency, National Aeronautics and Space Administration, and the National Science Foundation. Although support for various activities has come mostly from the federal agencies, the conduct of the Assessment has been carried out in a highly distributed manner. Each of a diverse set of activities has been led by a team comprised of experts drawn from universities and government, from the public and private sectors, and from the spectrum of stakeholder communities. Through workshops and assessments, a dialogue has been started about the significance of the scientific findings concerning climate change and the degree to which existing and future changes in climate will affect issues that people care about, both at present and in the future. The reports that have been prepared have all gone through an extensive review process involving scientific experts and other interested stakeholders, ensuring both their technical accuracy and balance.

Three types of activities have underpinned the Assessment effort:

1. **Regional analyses and assessments:** An initial series of workshops provided the basis for characterizing the potential consequences of climate variability and change in regions spanning the US. A total of 20 workshops were held around the country in 1997 and 1998; sixteen of these groups then went on to prepare assessment reports focusing on the most critical issues identified. These activities focused on the implications of the patterns and texture of changes where people live. Although issues considered often seemed to have a common thread, the implications often played out in different ways in different places. For example, various manifestations of the issue of water arose in virtually all regions, but the details were generally specific to each region.
2. **Sectoral analyses:** To explore the potential consequences for sectors of national interest that cut across environmental, economic, and societal interests, the Assessment examined implications for Agriculture, Forests, Human Health, Water, and Coastal Areas and Marine Resources. These sectoral studies analyzed how the consequences in each region would affect the Nation, and how national level changes would affect particular areas.
3. **National overview:** A fourteen-member National Assessment Synthesis Team (NAST) drawn from academe, industry, government, and non-governmental organizations had responsibility for summarizing and integrating the findings of the regional and sectoral studies and then drawing conclusions about the importance of climate change and variability for the United States. To document their findings, an extensive Foundation report was prepared that ties the

findings to the scientific literature. To convey their message to the broader public and leading decision makers, an Overview report was prepared that describes the key issues facing nine regions across the US and five sectors. An important advance was consistent use of a set of well-defined terms to indicate the relative likelihood of various outcomes based on the considered judgment of the experts that NAST represented. While some types of changes were found to be highly likely or unlikely, many were judged to be only possible based on current understanding. To gain better information, the NAST summarized key directions for research, urging particularly the strengthening of efforts to take an integrated look at the changing set of stresses facing regions and resource managers.

Additional information is available at <http://www.nacc.usgcrp.gov>